

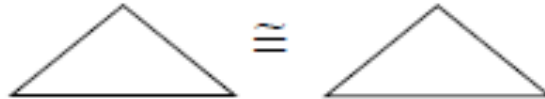
# Triangle Congruence Proofs

Recognizing SAS, ASA, AAS, SSS, and HL.

## Side-Angle-Side (SAS) Postulate

If two sides and the \_\_\_\_\_ angle of one triangle are congruent to the corresponding sides and the included angle of the other triangle, then the two triangles are \_\_\_\_\_.

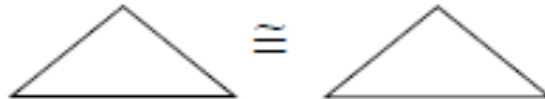
Ex:



## Angle-Side-Angle (ASA) Postulate

If two \_\_\_\_\_ and the included side of one triangle are congruent to the corresponding angles and included side of the other triangle, then the two triangles are congruent.

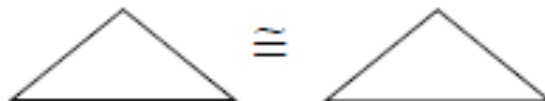
Ex:



## Side-Side-Side (SSS) Postulate

If the \_\_\_\_\_ sides of one triangle are congruent to the corresponding three sides of the other triangle, then the two triangles are congruent.

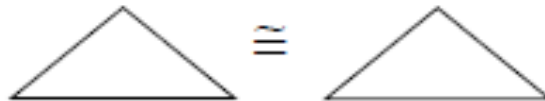
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## Angle-Angle-Side (AAS) Postulate

If two angles and the \_\_\_\_\_ side of one triangle are congruent to the corresponding two angles and the non-included side of the other triangle, then the two triangles are congruent.

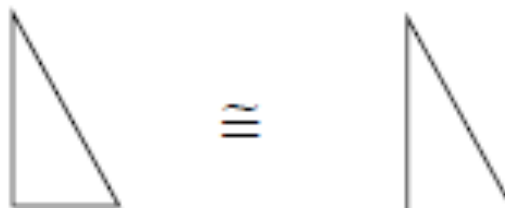
Ex:



## Hypotenuse-Leg (HL) Postulate

If the \_\_\_\_\_ and the \_\_\_\_\_ of one right triangle are congruent to the hypotenuse and corresponding leg of the other triangle, then the two triangles are congruent. (You can use either leg on one triangle, as long as you use the corresponding leg on the other!)

Ex:



Determine the method you could use to prove the two triangles are congruent, based on how the diagrams are marked. Choose from SAS, ASA, SSS, AAS, HL.

1. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

2. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

3. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

4. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

5. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

6. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

7. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

8. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

9. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

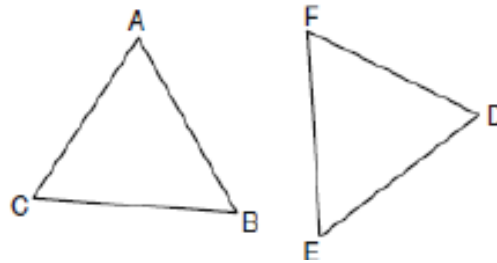
10. Method:

\_\_\_\_\_  $\cong$  \_\_\_\_\_

**Helpful Tips:** Before you begin your proof...

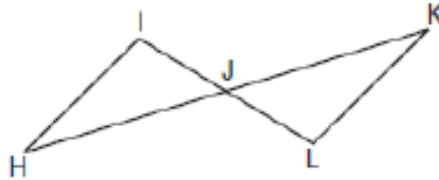
1. Mark your diagram with all the given information

In the diagram of  $\triangle ABC$  and  $\triangle DEF$  below,  $\overline{AB} \cong \overline{DE}$ ,  $\angle A \cong \angle D$ , and  $\angle B \cong \angle E$ .



2. Look for any hidden facts

In the accompanying diagram,  $\overline{HK}$  bisects  $\overline{IL}$  and  $\angle H \cong \angle K$ .



3. Identify the method you will use to prove the triangles congruent

Remember to look for **ONLY** these combinations for congruent triangles:  
***SAS, ASA, SSS, AAS, and HL*** (right triangle)

4. Know your definitions and use them to determine missing facts

Take note! A proof is like a big "puzzle" waiting to be solved. Look carefully at the "puzzle" and use all of your geometrical strategies to arrive at a solution!



Methods that **WILL NOT** always prove triangle congruence:

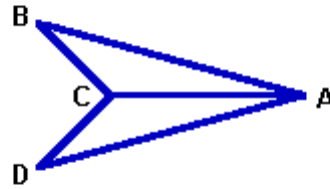
and



## Proving Triangles Congruent – Practice!

1) Given:  $\overline{AB} \cong \overline{AD}$ ,  $\overline{CB} \cong \overline{CD}$

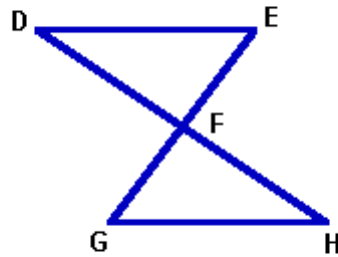
Prove:  $\triangle ABC \cong \triangle ADC$



Statements	Reasons
1) $\overline{AB} \cong \overline{AD}$	1) _____
2) $\overline{CB} \cong \overline{CD}$	2) _____
3) $\overline{AC} \cong \overline{AC}$	3) _____
4) $\triangle ABC \cong \triangle ADC$	4) _____

2) Given:  $\overline{EF} \cong \overline{FG}$ ,  $\overline{DF} \cong \overline{FH}$

Prove:  $\triangle DFE \cong \triangle HFG$



Statements	Reasons
1) $\overline{EF} \cong \overline{FG}$	1) _____
2) $\overline{DF} \cong \overline{FH}$	2) _____
3) $\angle DFE \cong \angle HFG$	3) _____
4) $\triangle DFE \cong \triangle HFG$	4) _____